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BIOLOGICAL EVALUATION OF THE FALL CANKERWORM
ON THE
ALLEGHENY NATIONAL FOREST

BY

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INTRODUCTION

The data presented for the biological evaluation was collected by Zone Entomologists and Allegheny National Forest personnel. The information collected in January 1967 indicates that larval population levels and defoliation will be lower in 1967; thus chemical suppression measures should not be needed.

In 1964 an outbreak of the fall cankerworm was detected on the Allegheny National Forest. At that time only a few scattered areas of light defoliation were detected on the Ridgway and Bradford Districts.

The outbreak and the severity of damage increased in 1965 and was of such major concern that 100,000 acres of forest land, east of the Allegheny National Forest, was sprayed with one-half pound DDT/acre to protect the valuable timber. In May 1966 the damage was still high enough to warrant suppression on the Twin Lakes and Kiasutha Recreation Areas to minimize defoliation and maintain appeal to its users.

TECHNICAL INFORMATION

a. Casual Agent

Fall cankerworm, Alsophila pometaria (Harris)

b. Host Tree Attacked

Black cherry, sugar maple, red maple, American beech, white oak, yellow birch, red oak and other hardwoods.

c. Type of Damage

Larval feeding on host foliage resulting in growth reduction and decreased vigor. No tree or twig mortality has been attributed to the fall cankerworm after three years of defoliation.

The defoliation also reduces the aesthetic values and makes the Forest and its recreational areas less appealing to its users.

d. Biological Data

Results of the biological evaluation showed that the female cankerworms were not depositing their full complement of eggs. Female cankerworms collected on the Allegheny National Forest deposited only twenty eggs/female when reared under laboratory conditions. This is far lower than the 100+ eggs normally deposited per female.

Preliminary examination by personnel at Northeastern Forest Experiment Station revealed that the ovaries of the females were malformed. This might be a contributing factor in the low number of eggs deposited by the females. Egg sampling methods used on the bole and the branches also indicated low egg numbers.

Further information regarding techniques used in the biological data are included in the Appendix.

Calosoma beetles were numerous and were observed in most areas of defoliation in 1966. Although numerous, they did not seem effective in controlling the larval population.

No larvae killed by other predators, parasites, or pathogens were observed.

e. Environmental Factors

No environment factors to date have exerted an effective control measure for reducing fall cankerworm populations.

f. Extent and Location of Outbreaks

In June 1966 the Allegheny National Forest was flown to determine the infestation boundaries and severity of damage.

The results from the survey indicated that approximately 130,000 acres on the Allegheny National Forest were being defoliated by the fall cankerworm. Locations of infestation boundaries and severity of damage are shown on the attached map.

RECOMMENDATIONS

The results of the biological evaluation indicate that suppression will not be warranted in 1967 for the fall cankerworm on the Allegheny National Forest. It is recommended that the Zone conduct surveys in 1967, starting in May or June, to determine the severity and extent of damage and what natural forces may be affecting the fall cankerworm population.

DISTRIBUTION:

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APPENDIX

In November and December 1966 a tree banding technique was used for predicting 1967 defoliation by the fall cankerworm. Twenty sample areas were set up on the Allegheny National Forest in north central Pennsylvania. On each plot ten dominant and/or co-dominant trees were banded with "Stikem" to trap the wingless females as they crawled up the tree. The bands were applied at 4 feet from the ground and in a 4" band encircling the tree.

The number of females captured per tree (Table I) coupled with the number of eggs deposited by each female served as a basis for estimating the 1967 larval population. Females collected near the base of the trees in the observation areas deposited only about 20 eggs per female when reared under laboratory conditions. This is far lower than the 100+ eggs normally deposited per female.

These females were kept in rearing cages until they had laid their complement of eggs and died. The females were then sent to Northeastern Forest Experiment Station at West Haven for examination. Preliminary examination by personnel at the station revealed that the ovaries contained no eggs and were malformed. This might be a contributing factor in the low number of eggs deposited by the females.

These low numbers were reflected in an egg survey made on the bole and branch ends of the trees in the infestation area, (Table II). The eggs on the base of the tree were counted on 20 square inches of the bole by the use of a one-square inch ring. The ring was placed randomly on the bole of the tree below 6 feet in height twenty times and the number of eggs falling within the ring recorded. The total count divided by twenty gives the average egg count per square inch.

The branch cutting technique provided an index by counting the number of eggs (Fig. 1) on five 30-inch branch ends. These two methods of obtaining the egg counts compared with similar data taken in 1965 and indicates that the failure of the females to deposit their normal complement of eggs will result in a lower population level in 1967.

TABLE I

<u>Area #</u>	<u>Location</u>	<u>Ave. female count/tree</u>
1	Near Kane Ex forest	265
2	Near Kane Ex forest	93
3	Near Kane Ex forest	108
4	James City	168
5	Windy City	178
6	Jojo	224
7	Hoffman Farm Plantation	23
8	Gibbs Hill	95
9	Between Ludlow and Kane	6.4
10	Hubert Run	35
11	North of McDade Tower	84
12	North of McDade Tower	128
13	North of McDade Tower	105
14	McDade Run Road	50
15	2 miles east of Kinzua Hts. Rd.	66
16	Kinzua Hts. Rd.	48
17	Kinzua Hts. Rd.	50
18	Johnny Cake Trail	108
19	Johnny Cake Trail	27
20	Coffey Run	34

TABLE II

Plot Ave. Basal Eggs	Bole Egg Count		Twig Egg Count	
	1965	1966	1965	1966
2	.5	.07	0	4.0
4	3.5	.23	2.6	22.0
8	5.5	.35	19.6	5.3
16	6.5	-	44.3	-

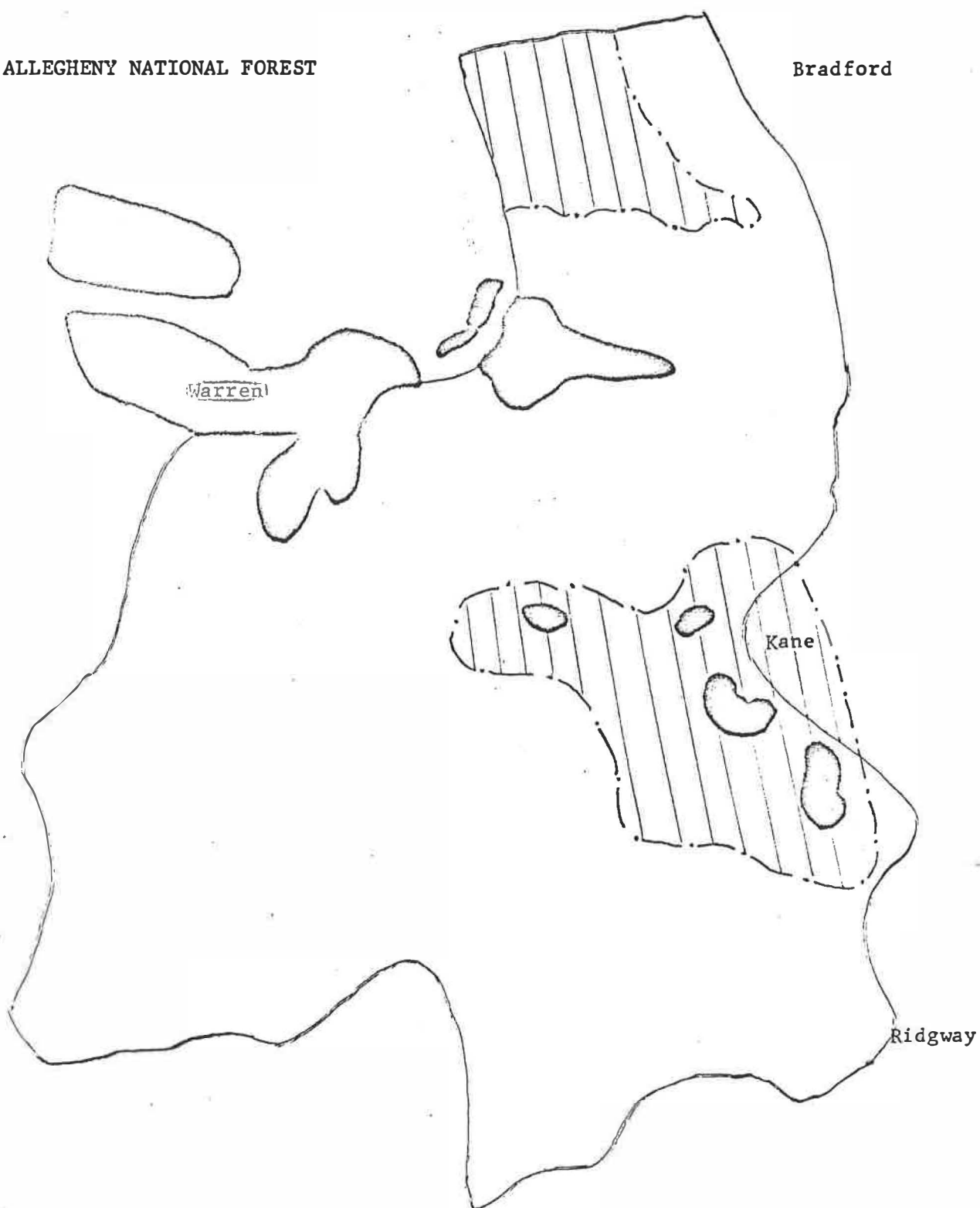
Fig. 1



Twigs showing old (upper two) and new (lower) cankerworm egg masses.

ALLEGHENY NATIONAL FOREST

Bradford



 Moderate-heavy fall cankerworm defoliation

 Light-moderate fall cankerworm defoliation

UNITED STATES GOVERNMENT

Department of Agriculture—Forest Service

R-9

Memorandum

Warren, Pennsylvania 16365
Allegheny National Forest

TO : District Rangers, Ridgway and Bradford

File No. 5240

FROM : P. W. Sundheimer, Timber Management Asst.

Date: March 16, 1967

SUBJECT: Suppression

Your reference:

We now have a biological evaluation of the fall cankerworm from the Delaware Forest Pest Control Zone office. They report that egg production by the female moths was very poor.

In view of this, they recommend that suppression will not be warranted in 1967. Suppression projects scheduled for your district are therefore cancelled.

PWSundheimer:nrs

Paul W. Sundheimer